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November 25, 1998

Ms. Magalie Roman Salas, Secretary
Office of the Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Dear Secretary Salas,

Enclosed please find one original and ten copies of our formal comments in reference to the proposed FCC Rulemaking, MM Docket No. 98-93, FCC 98-117, "*In the Matter of 1998 Biennial Regulatory Review -- Streamlining of Radio Technical Rules in Parts 73 and 74 of the Commission's Rules*".

Please stamp the tenth copy as our official receipt and return it to us in the pre-addressed, prepaid envelope.

Please contact me immediately if any additional material or clarification is desired.

Thank you for consideration of our opinions and suggestions.

Sincerely,

Deborah S. Proctor
General Manager

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ORIGINAL

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
1998 Biennial Regulatory Review—	)	MM Docket No. 98-93
Streamlining of Radio Technical Rules in	)	
Parts 73 and 74 of the Commission's Rules	)	

To: The Commission

REPLY COMMENTS OF EDUCATIONAL INFORMATION CORPORATION

Educational Information Corporation ("EIC"), licensee of non-commercial educational broadcast station WCPE-FM, Raleigh, North Carolina, hereby files the following Reply Comments in response to the *Notice of Proposed Rule Making and Order* ("*Notice*"), FCC 98-117, released June 15, 1998, in the above-captioned proceeding. The *Notice* sought comment on several significant proposals to streamline the Commission's technical rules governing radio broadcast stations, including a number of proposals that would give radio stations greater technical flexibility.

A wide variety of broadcasting interests duly filed comments, from licensees owning just one station, such as EIC, to group owners with hundreds of stations in their stable, such as Cumulus Media, Inc. A few of the Commission's proposals, most notably the proposal to permit FM broadcasters seeking to modify their transmission facilities the opportunity to negotiate interference agreements with other broadcasters, generated widely divergent views. However, the record before the Commission demonstrates overwhelming support for at least one core idea, viz. that the Commission should act to bring the commercial and non-commercial FM services into technical and procedural parity, including by eliminating the inconsistency between the differing interference

protection standards and by extending first come/first served processing to non-commercial FM minor change applications.

I. The Commission Should Eliminate the Inconsistency Between the Commercial and Non-Commercial Station Interference Protection Standards

In the *Notice*, the Commission proposed to modify 47 C.F.R. § 73.509 and § 74.1204(a) to specify a 100 dBu interfering contour for second-adjacent channel NCE and FM translator stations, as exists for commercial FM stations.[1] This proposal garnered the universal support of those considering the issue; not one commenter specifically objected to it.[2] The support of two engineering firms and the Association of Federal Communications Consulting Engineers is particularly noteworthy since, as EIC has pointed out, the laws of physics do not discriminate between commercial and NCE stations and, therefore, there is no physical or public policy reason that the two categories of stations should be treated any differently. The record before the Commission in this proceeding clearly supports this proposed change, for it will not only preserve

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[1] *See Notice* at ¶ 56.

[2] *See* Comments of Graham Brock, Inc. at ¶ 9; Comments of du Treil, Lundin & Rackley, Inc. at 7; Comments of Association of Federal Communications Consulting Engineers at 6; Comments of National Public Radio, Inc. at 2; Comments of Hardy & Carey at 23; Comments of Sound of Life, Inc. at 5-6; Comments of Northeastern University, Engineering Exhibit at 2-3; Comments of V-Soft Communications at 6; *cf.* Comments of South Central Communications Corporation at 11 (stating its general support for various changes).

There is disagreement among the commenters concerning the Commission's proposal to reduce the mileage separation requirements for second-adjacent and third-adjacent channel *commercial* stations. *See Notice* at ¶ 37. The National Association of Broadcasters ("NAB"), most notably, is opposed to this change. *See* Comments of NAB at 23-24. That disagreement, however, has nothing to do with the proposal to bring the interfering contour for second-adjacent *noncommercial* stations into parity with that for commercial stations. NAB, for example, nowhere discusses in its comments this latter proposal. EIC took no stance on the Commission's mileage separation reduction proposal for commercial stations in its initial Comments; now, EIC merely seeks to avoid possible confusion over these two entirely different issues.

or improve the integrity of the FM band, but it will also bring desirable scientific and logical equivalence to the Commission's rules. Such a change is thus at the heart of the Commission's efforts to "streamline" its technical rules with the added benefit that it will greatly reduce the current, unnecessary regulatory burden facing certain NCE FM stations, stations that are often the least able to afford such burdens.

EIC submits that the change will provide much needed flexibility for "short-spaced" NCE FM stations to change transmitter facilities or operating parameters, thereby permitting them to respond to changing circumstances, to reach their listening audience more efficiently and effectively while controlling interference, and to serve the public interest. The Commission should adopt the proposal forthwith.

II. First Come/First Served Processing Should Be Extended to AM and NCE FM Minor Change Applications

In the *Notice*, the Commission proposed to extend the first come/first served processing system to AM and NCE FM minor change applications.[3] This proposal also received overwhelming support.[4] The engineering firm of Hatfield & Dawson agrees with EIC that a first come/first served processing system should not apply to FM translators because they are plainly a secondary service.[5]

In its initial Comments, EIC suggested that the Commission should be wary lest certain

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[3] *See Notice* at ¶ 47.

[4] *See, e.g.*, Comments of National Public Radio, Inc. at 8-9; Comments of du Treil, Lundin & Rackley, Inc. at 7; Comments of Association of Federal Communications Consulting Engineers at 6; Comments of Hardy & Carey at 19; Comments of Sound of Life, Inc. at 5; Comments of South Central Communications Corporation at 11; Comments of Hatfield & Dawson Consulting Engineers at 10; Comments of West Virginia Radio Corporation at 5; Comments of V-Soft Communications at 6.

[5] *See* Comments of Hatfield & Dawson at 10.

broadcasters implement a "blanket the earth" policy and, accordingly, apply for every open frequency remaining.[6] Similar concerns were raised by National Public Radio ("NPR") and V-Soft Communications ("V-Soft").[7] EIC joins NPR and V-Soft in urging the Commission to remain vigilant in protecting the public interest from those who would abuse the process or attempt to "warehouse" spectrum without the financial ability to actually construct all of the facilities requested.

With these provisos in mind, the Commission should adopt this proposal.

III. Negotiated Interference Can Be Scaled Back to Apply Only to Existing Mutually-Exclusive Applications

Perhaps no proposal received more widely divergent opinions than the Commission's proposal to permit both commercial and NCE FM stations to negotiate agreements and to file coordinated facility modifications in cases where new or increased interference would result, subject to four criteria.[8] EIC stands by its initial Comments on this matter, which supported the general proposal, but which suggested that certain criteria be loosened while the Commission's oversight be tightened.[9] Should the Commission decide not to adopt the change, as proposed or as initially advocated by EIC, then EIC suggests, as an alternative only, that the Commission could adopt a less than full-scale negotiated interference policy. In particular, as a compromise, EIC proposes that the Commission permit negotiated interference, subject to limited restrictions as discussed in this

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[6] *See* Comments of EIC at 11.

[7] *See* Comments of NPR at 8-9; Comments of V-Soft at 6.

[8] *See Notice* at ¶¶ 17 *et seq.*

[9] *See* Comments of EIC at 4-10.

proceeding, only for those situations in which mutually-exclusive applications currently exist for either commercial or NCE FM stations.

This compromise position would have multiple benefits. First, it would provide a mutually acceptable means by which currently mutually-exclusive applicants can resolve their situations, and it would save the Commission the trouble of doing so in most instances. Second, it would not open a Pandora's Box of feared widespread degradation of the FM service, as some, such as NAB most notably,[10] worry, for it would apply only in a finite number of limited circumstances. Finally, it would establish a track record by which the Commission could judge the propriety of further expansion of the policy at a later date.

Negotiated interference, properly implemented and closely monitored, is a good idea that should be given an opportunity to prove its value to broadcasters and the public they serve.

IV. The Feared Spectre of the "AM-ization" of the FM Band Makes Good Rhetoric but Bad Physics

A number of commenters have raised the spectre of the "AM-ization" of the FM band in opposition to the proposed relaxation of a number of rules. This rationale is based not upon logic or science but upon rhetoric. EIC submits that the Commission should be wary of seductive rhetoric that ignores the real world characteristics of radio propagation and reception. Just as EIC has argued that the laws of physics are the same for the reserved and non-reserved bands of the FM spectrum, and thus that commercial and NCE FM stations should be treated similarly, now EIC must point out that the physical propagation characteristics of the longwave-AM band are, in fact, entirely different from those of the VHF-FM band. The Commission's policies governing its technical rules should

[10] *See* Comments of NAB at 9-20.

always be grounded in the physical reality that underlies radio broadcasting.

That the AM and FM bands are fundamentally different—literally as different as day and night—is manifest. Nighttime skywave propagation can be so strong that most AM stations must reduce power or go off the air at night; even the definition of protected contour for AM stations must be changed from day to night. In contrast, FM propagation is not affected by skywave considerations. Moreover, amplitude modulation conveys information in a totally different way than frequency modulation, and the physics of the two are strikingly different. For example, when receiving a weak AM station, the standard AM envelope detector produces an *increase* in noise output[11]; conversely, the FM detector produces a *decrease* in noise.[12] Increasing the modulation index in AM reception above 1.0 (unity) causes distortion in AM reception using a typical envelope detector, but increasing the modulation index in FM reception results in a substantially increased signal to noise ratio and immunity to interference. Again, there is the possibility of single-sideband or vestigial-sideband AM, but the laws of physics do not permit single-sideband FM.[13] Finally, the AM carrier is always present at constant amplitude and phase; the FM carrier frequently disappears or even "goes negative," i.e., reverses phase.

In short, the feared "AM-ization" of the FM band may make good rhetoric, but there is scant basis for it in the governing laws of physics. If every FM station in the country were to increase

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[11] This is because the carrier "beats" with the background noise, producing additional in-band noise products—this is how one knows that there is "something there" between two quiet frequencies.

[12] This is because the noise vector can no longer cause 180° and 360° degree jumps in phase when summed with the carrier vector—this is the cause of "FM quieting."

[13] AM sidebands are always mirror images of each other, and only one is needed for demodulation. With anything other than single pure-tone modulation, FM sidebands are intrinsically different, and both are needed for proper demodulation.

power by, say, four times, then, on paper, the interference would appear to be horrendous. In practice, however—and in the real world where real radio stations must operate—few new cases of interference would actually occur because the ratios of signals would remain substantially the same.[14] Moreover, and, again, practically speaking, many new areas would experience multiple new FM services because now receivers would have enough signal to go into "FM quieting" mode.

The Commission should always strive to be guided by the physics of the real world—without predetermined bias—to arrive at decisions that are truly in the public interest. EIC submits that, once examined in the light of science, this spectre of "AM-ization" will dissolve into thin air where it will not cause any interference with real-world FM radio waves.

Conclusion

For the foregoing reasons, the record in this proceeding demonstrates that the Commission should act to bring the commercial and non-commercial FM services into technical and procedural parity. Accordingly, the Commission should eliminate the inconsistency between the commercial

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[14] This hypothetical, far from being far-fetched, is, in fact, based on the Commission's own experience: Previously, Class A commercial FM stations used to be limited to 3000 watts, horizontally polarized. A typical, representative Class A FM station with a four bay antenna used a transmitter power output ("TPO") of approximately 750 watts, for an effective radiated power ("ERP") of 3000 watts. Subsequently, the Commission permitted all VHF broadcasters, both radio and television, to add a quadrature vertical component to create a circularly polarized signal so that better coverage could be obtained. The result is that TPO was doubled, although the Commission treated the vertical component as not increasing the ERP because of the 90° relationship of the vertical vector. In practice, our representative station now drove its new four bay circularly polarized antenna with approximately 1500 watts from its transmitter. No new cases of interference ensued because nearly all stations upgraded to circular polarization. Finally, the Commission allowed nearly all Class A stations to double their transmitter power again, resulting in a quadrupling of the original power delivered to the transmitting antenna, or 3000 watts TPO (currently the most common transmitter size) for our now typical 6000 watt ERP Class A FM station. Again, no substantial interference problems occurred. This past experience illustrates well the difference between AM and FM radio propagation and the benefits of relying upon the laws of physics to make sound technical and policy judgments.

FM and NCE FM interference protection standards, and it should extend first come/first served processing to non-commercial FM, as well as AM, minor change applications. In addition, the Commission should permit negotiated interference agreements, at least to a limited extent, both for commercial and non-commercial FM stations. The Commission is right to "streamline" its technical rules and to reduce regulatory intervention into the technical aspects of the radio broadcast services—so long as it is guided always by the laws of physics—but it must maintain its critical vigilance in enforcing its remaining procedures to protect the public's interest in the fair and equitable utilization of radio spectrum.

Respectfully submitted, this the 25 day of November, 1998.

By Deborah S. Proctor

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